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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/847,111	05/02/2001	Ya-Chan Cheng	148693.00359	5405

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Thomas T. Moga, Esq.  
Dickinson Wright PLLC  
1901 L Street NW  
Suite 800  
Washington, DC 20036

EXAMINER

STOCK JR, GORDON J

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/847,111

Applicant(s)

CHENG, YA-CHAN

Examiner

Gordon J. Stock

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7,9-15 and 17-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-15 and 17-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 18, 2005 has been entered.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1-2, 6, 7, 9, 10, 14-15, 21-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Imai et al. (5,818,596)**—previously cited in view of **Sampsell et al. (5,327,286)**

As for **claims 1-2, 6, 7, 9, 10, 14-15, 21-23**, Imai in a film thickness measuring apparatus discloses the following: a stage located on a transport apparatus, wafer transport chamber apparatus (Fig. 1: 54, 48); a platen for the wafer (Fig. 1: 62) with wafer cassette too (Fig. 1: C); a lens above stage in film thickness measuring system suggested by irradiating units and detecting units above stage (Fig. 1: 56, 58); a gas supplier that supplies inert nitrogen gas (Fig. 1: 68, 70, 72; col. 2, lines 60-65); a first gas nozzle on a side of said platen to exhaust gas into chamber (Fig. 1: 64c, 64d); a second nozzle on side of stage (Fig. 1: 64a); a first tube and second

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tube suggested by gas pipes from gas supplier to nozzles (Fig. 1: 66), wherein a gas stream is formed from arrows entering chamber from nozzles to exhaust system (Fig. 1: 64a-64e, 76, 80, 82); a transport slot that has a channel to collect and exhaust gases (Fig. 1: 76); gas extracting apparatus with third tube suggested by arrow from 76 to 82 in Fig. 1; valve on first nozzle (Fig. 1: 70); a robot moves wafer (Fig. 1: 62); as for a movable stage, Imai is silent. However, the system is a film measuring system (Fig. 1: 56 and 58). And Examiner takes official notice that movable stages are well known in the art for positioning and aligning wafers in measurement systems. Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have the measuring table be movable in order to position the wafer precisely under the measurement apparatus above.

As for a datum platen with datum slice as a measuring reference point, Imai is silent. However, Sampsell in a real time optical correlation system teaches using a datum slice with datum platen for measurement correlation (Fig. 5: 41, 53; col. 1, lines 10-20). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have a datum platen with datum slice beside the wafer under test in order to provide a reference point to quantify the thickness measurement.

4. **Claims 3, 11, 17, 19, and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Imai et al. (5,818,596)**—previously cited in view of **Sampsell et al. (5,327,286)** further in view of **Iida et al. (5,527,417)**—previously cited

As for **claims 3 and 11**, Imai in view of Sampsell disclose everything as above (see **claims 1 and 9** above). In addition, Imai discloses a second nozzle to the oxygen supplier (Fig. 1: 70). Imai is silent concerning valves on the tubes to the other plurality of nozzles, but there is

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at least one valve to one nozzle (Fig. 1: 70 with 72). However, Iida in a wafer process apparatus teaches having a valve for a nozzle to control gas into the chamber (col. 20, lines 1-15).

Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have each nozzle have an accompanying valve in order to control the amount of gas entering the chamber.

As for **claims 17, 19, 20**, Imai in a film thickness measuring apparatus discloses the following: a stage located on a transport apparatus, wafer transport chamber apparatus (Fig. 1: 54, 48); a platen for the wafer (Fig. 1: 62) with wafer cassette too (Fig. 1: C); a lens above stage in film thickness measuring system suggested by irradiating units and detecting units above stage (Fig. 1: 56, 58); a gas supplier that supplies inert nitrogen gas (Fig. 1: 68, 70, 72; col. 2, lines 60-65); a first gas nozzle on a side of said datum platen to exhaust gas into chamber (Fig. 1: 64c, 64d); a second nozzle on side of stage (Fig. 1: 64a); a first tube and second tube suggested by gas pipes from gas supplier to nozzles (Fig. 1: 66), wherein a gas stream is formed from arrows entering chamber from nozzles to exhaust system (Fig. 1: 64a-64e, 76, 80, 82); a transport slot that has a channel to collect and exhaust gases (Fig. 1: 76); gas extracting apparatus with third tube suggested by arrow from 76 to 82 in Fig. 1; valve on first nozzle (Fig. 1: 70); a robot moves wafer (Fig. 1: 62); as for a movable stage, Imai is silent. However, the system is a film measuring system (Fig. 1: 56 and 58). However, the system is a film measuring system (Fig. 1: 56 and 58). And Examiner takes official notice that movable stages are well known in the art for positioning and aligning wafers in measurement systems. Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have the measuring table be movable in order to position the wafer precisely under the measurement apparatus above.

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As for a datum platen with datum slice as a measuring reference point, Imai is silent. However, Sampsell in a real time optical correlation system teaches using a datum slice with datum platen for measurement correlation (Fig. 5: 41, 53; col. 1, lines 10-20). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have a datum platen with datum slice beside the wafer under test in order to provide a reference point to quantify the thickness measurement.

In addition, Imai discloses a second nozzle to the oxygen supplier (Fig. 1: 70). Imai is silent concerning valves on the tubes to the other plurality of nozzles, but there is at least one valve to one nozzle (Fig. 1: 70 with 72). However, Iida in a wafer process apparatus teaches having a valve for a nozzle to control gas into the chamber (col. 20, lines 1-15). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have each nozzle have an accompanying valve in order to control the amount of gas entering the chamber.

5. **Claims 4, 5, 12, and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Imai et al. (5,818,596)**—previously cited in view of **Sampsell et al. (5,327,286)** further in view of **Danese (6,272,768)**—previously cited.

As for **claims 4, 5, 12, 13**, Imai in view of Sampsell disclose everything as above (see **claims 1 and 9** above). However, they are silent concerning a venturi structure for the exhaust system or a motor for the exhaust system. Danese in an apparatus for processing wafers teaches that venturi pumps and root pumps are typical vacuum pumps for withdrawing fluids (col. 7, lines 5-25). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made that the system may comprise a venturi structure or a motor for typical

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vacuum pumps for withdrawal of fluids for wafer processing systems comprise venturi effect pumps or root pumps.

6. **Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Imai et al. (5,818,596)**—previously cited in view of **Sampsell et al. (5,327,286)** further in view of **Iida et al. (5,527,417)**—previously cited further in view of **Danese (6,272,768)**—previously cited.

As for **claim 18**, Imai in view of Sampsell and Iida disclose everything as above (see **claim 17** above). However, Imai is silent concerning a venturi structure for the exhaust system. Danese in an apparatus for processing wafers teaches that venturi pumps are typical vacuum pumps for withdrawing fluids (col. 7, lines 5-25). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made that the system may comprise a venturi structure for typical vacuum pumps for withdrawal of fluids for wafer processing systems comprise venturi effect pumps.

7. **Claims 24-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Imai et al. (5,818,596)**—previously cited in view of **Sampsell et al. (5,327,286)** further in view of **Sato et al. (5,766,360)**—previously cited and **Lane et al. (4,967,381)**.

As for **claims 24-25**, Imai in view of Sampsell disclose everything as above (see claims 1 and 9). In addition, Imai discloses means for placing said wafer on said stage, a robot moves wafer (Fig. 1: 62); wherein in view of Sampsell stage is movable upon a movable transport apparatus to position properly under inspection system (Sampsell: Fig. 5, 51, 52, 53); means for irradiating light to the sample (Fig. 1: 56).

As for measuring the thickness of the wafer, Imai is silent, but the system measures film thickness (col. 5, lines 1-10). Sato in a substrate processing apparatus teaches that film

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measuring may comprise measuring the thickness of the wafer before and after film deposition (col. 6, lines 10-15). Therefore, it would be obvious to one skilled in the art to substitute film thickness with measuring wafer thickness before and after film deposition, for they are equivalent measurements in the art, for measuring film thickness on a wafer.

As for data being shown on a monitor and being analyzed to obtain thicknesses, Imai is silent. However, Lane in a process control interface teaches having a display and analysis means such as a cpu in order to monitor processes (Fig. 1: 36, 32). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have a monitor and analysis means in order to monitor film thickness and to provide process control.

8. **Claim 26** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Imai et al. (5,818,596)**—previously cited in view of **Sampsell et al. (5,327,286)** further in view of **Iida et al. (5,527,417)**—previously cited further in view of **Sato et al. (5,766,360)**—previously cited and **Lane et al. (4,967,381)**.

As for **claim 26**, Imai in view of Sampsell and Iida disclose everything as above (see **claim 17**). In addition, Imai discloses means for placing said wafer on said stage, a robot moves wafer (Fig. 1: 62); wherein in view of Sampsell stage is movable upon a movable transport apparatus to position properly under inspection system (Sampsell: Fig. 5, 51, 52, 53); means for irradiating light to the sample (Fig. 1: 56).

As for measuring the thickness of the wafer, Imai is silent, but the system measures film thickness (col. 5, lines 1-10). Sato in a substrate processing apparatus teaches that film measuring may comprise measuring the thickness of the wafer before and after film deposition (col. 6, lines 10-15). Therefore, it would be obvious to one skilled in the art to substitute film



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thickness with measuring wafer thickness before and after film deposition, for they are equivalent measurements in the art, for measuring film thickness on a wafer.

As for data being shown on a monitor and being analyzed to obtain thicknesses, Imai is silent. However, Lane in a process control interface teaches having a display and analysis means such as a cpu in order to monitor processes (Fig. 1: 36, 32). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have a monitor and analysis means in order to monitor film thickness and to provide process control.

### *Response to Arguments*

9. Applicant's arguments with respect to the claims 1-2, 7, 9, 10, 14-15 and 21-25 have been considered but are moot in view of the new ground(s) of rejection. However, Examiner will address the following: as for Imai not having "a lens located above said stage that is used in measurement of a thickness of said wafer and datum slice (page 11 of Remarks)" Examiner disagrees for Imai suggests having a lens above stage in film thickness measuring system suggested by irradiating units and detecting units above stage (Fig. 1: 56, 58). And as for "is used in measurement of a thickness of said wafer and datum slice," it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F.2d 1647 (1987). As for Imai not using an inert gas (page 12 of Remarks), Imai does teach using inert nitrogen gas col. 2, lines 60-65).

In regards to claims 3, 11, 17, 19, 20, and 26 with the purpose of the nozzle being different (page 13 of Remarks): again, "to exhaust said gas" and "to exhaust said gas in said gas stream" are intended uses of the nozzles. It has been held that a recitation with respect to the

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manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex Parte Masham, 2 USPQ F.2d 1647 (1987).

In regards to the arguments for claims 4, 5, 12, and 13 on page 14 of Remarks, they have been considered but are moot in view of the new ground(s) of rejection. In regards to the argument on page 12 that the measurements are different because Imai uses a phase difference and the present invention utilizes data returned, Examiner disagrees. "Data returned from said irradiation" does not preclude phase difference information from irradiating a surface.

In regards to claim 18's rejection on page 15 of Remarks: again, "to exhaust gas in said gas stream" are intended uses of the nozzles. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex Parte Masham, 2 USPQ F.2d 1647 (1987).

#### ***Fax/Telephone Numbers***

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

- 1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and
- 2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

*Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The*

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*form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (571) 273-8300*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431.

The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached at 571-272-2800 ext 77.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private Pair system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



gs

August 21, 2005



Layla Lauchman  
Primary Examiner  
Art Unit 2877